An Approximate Score Confidence Interval for A Population Proportion

Assumptions

The datum is Y from a $b(n, p)$ population.

Formulas

An approximate score level L confidence interval for p is $\left(\tilde{p} - \hat{\sigma}(\tilde{p}) z_{\frac{1+L}{2}},\ \tilde{p} + \hat{\sigma}(\tilde{p}) z_{\frac{1+L}{2}}\right)$, where $\hat{\sigma}(\tilde{p}) = \sqrt{\tilde{p}(1-\tilde{p})/n}$, $\tilde{p} = \frac{y + 0.5 z^2_{(1+L)/2}}{n + z^2_{(1+L)/2}}$, and $z_{\frac{1+L}{2}}$ may be obtained from a table of quantiles of the standard normal distribution (click here).

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